IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	KARL, Stefan
Appl. No.	:	09/802,982
Filed	:	March 12, 2001
Title	:	DEVICE FOR HEATING AND/OR AIR-CONDITIONING THE PASSENGER COMPARTMENT OR A MOTOR VEHICLE
Group Art Unit	:	3753
Examiner	:	FORD, John K.
Docket No.	:	01200.473

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APPEAL BRIEF UNDER 37 C.F.R. § 41.37

May 18, 2005

Board of Patent Appeal and interferences
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

In follow-up to the Notice of Appeal filed April 8, 2005, Appellant respectfully requests the Board of Patent Appeals and Interferences consider the following arguments and reverse the decision of the Examiner in whole. Applicant has filed concurrently herewith an amendment intended to reduce the issues for Appeal.

(1) Real Party in Interest

The real party in interest is VALEO CLIMATISATION.

(2) Related Appeals and Interferences

There are no known related appeals or interferences, which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal.

(3) STATUS OF CLAIMS

1. Claims 1-3 and 8-23 are pending in the application. All amendments have been entered and considered.

2. Claims 4-7 have been canceled.

3. Claims 3 and 16 have been withdrawn from consideration as not readable to the elected species of Figure 3.

4. Claims 1, 2, 8-15 and 17-23 have been rejected and are being appealed.

(4) STATUS OF AMENDMENTS

The Office Action finally rejecting claims 1, 2, 8-15 and 17-23 was mailed on January 21, 2005. Applicant subsequently filed a Notice of Appeal on April 8, 2005 to appeal the Examiner's rejection of claims 1, 2, 8-15 and 17-23.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

The instant invention, as claimed in independent claim 1, is directed to a device for heating and/or air conditioning the passenger compartment 6 of a motor vehicle, illustrated in Fig. 3. The device comprises an engine-cooling loop 4 in which a heat-carrying fluid circulates for taking up heat from the engine 2 and returning the heat to an air heater 8 (page 6, lines 23-26), and a heat-pump loop 14 in which a refrigerant fluid circulates (page 6, line 31 – page 7, line 2). The heat-pump loop contains a compressor 18, a first evaporator 16 constituting a cold source of the heat pump at which the refrigerant fluid takes up heat from the surroundings, and a first condenser 20 constituting a hot source of the heat pump at which the refrigerant fluid gives up heat (page 7, lines 2-8). As shown in Fig. 3, the first condenser 20 is integrated into the engine-cooling loop 4 upstream of the air heater 8 (page 8, lines 4-8). The device as recited in claim 1, further comprises an air-conditioning branch 34 containing a second condenser 36 and a second evaporator 40 (page 10, lines 4-8). The air-conditioning branch 34 has an upstream end connected to the heat-pump loop 14 downstream of the compressor 18, a downstream end connected to the heat-pump loop upstream of the compressor 18, and a switching device 48 making it possible to make the refrigerant fluid circulate either in the air-conditioning branch 34, or in the heat-pump branch 14 (page 10, lines 15-20).

According to claim 2, the evaporator 16 of the heat-pump loop 14 is integrated into the cooling loop 4 upstream of the engine 2 (see Fig. 3 and page 13, lines 7-9).

According to claim 8, the air-conditioning branch 34 includes a refrigerant-fluid accumulator (page 12, lines 18-21).

According to claim 9, the evaporator constitutes a refrigerant-fluid accumulator common to the air-conditioning loop and to the heat-pump loop (page 12, lines 18-21).

According to claim 10, the air-conditioning branch includes an anti-return valve 42 (page 10, lines 7-8).

According to claim 11, the heat-pump loop includes pressure-reducing means 22 for reducing the pressure of the refrigerant fluid between the condenser and the evaporator (page 7, lines 4-6).

The instant invention, as claimed in independent claim 12, is directed to a device for heating and/or air conditioning the passenger compartment 6 of a motor vehicle, illustrated in Fig. 3. The device comprises an engine-cooling loop 4 in which a heat-carrying fluid circulates for taking up heat from the engine 2 and returning the heat to an air heater 8 (page 6, lines 23-26), and a heat-pump loop 14 in which a refrigerant fluid circulates (page 6, line 31 – page 7, line 2). The heat-pump loop 14 contains a compressor 18, a first evaporator 16 constituting a cold source of the heat pump at which the refrigerant fluid takes up heat from the surroundings, and a first condenser 20 constituting a hot source of the heat pump at which the refrigerant fluid gives up heat (page 7, lines 2-8). The first condenser 20 is integrated into the engine-cooling loop 4 upstream of the air heater 8 (page 8, lines 4-8). The device as recited in claim 12, further comprises an air-conditioning branch 34 containing a second condenser 36 and a second evaporator 40 (page 10, lines 4-8). The air-conditioning branch 34 has an upstream end connected to the heat-pump loop 14 downstream of the compressor 18, a downstream end connected to the heat-pump loop 14 upstream of the compressor 18, and a switching device 48 making it possible to make the refrigerant fluid circulate either in the air-conditioning branch 34, or in the heat-pump loop 14 (page 10, lines 15-20).

The device as recited in claim 12, further comprises a modular casing 52 containing the first evaporator 16 (page 13, lines 2-7), first valve system 26, 27 of the first evaporator 16 for controlling the quantity of heat-carrying fluid which passes through the first evaporator 16 (page 7, lines 19-28 and page 12, lines 6-9), an anti-return valve 42 (page 10, lines 7-8) upstream of the evaporator 16, the first condenser 20, second valve system 30, 31 of the first condenser 20 (page 8, lines 14-27 and page 12, lines 23-26) for controlling the quantity of heat-carrying fluid which passes through the first condenser 20, the switching device 48 and a pressure-reduction means 22 of the heat-pump loop 14 for reducing the pressure of the refrigerant fluid between the first condenser 20 and the first evaporator 16 (page 7, lines 4-6). The first valve system 26, 27 is operatively connected with the second valve 30, 31 to control an intake pressure of the compressor 18 (page 9, lines 2-7, 13-15 and 26-32; and page 12, lines 22-28).

According to claim 14, the engine 2 is an electric motor (page 6, lines 17-19).

According to claim 15, the device of claim 1 further comprises an evaporator heat regulating loop comprising a first valve system 26, 27 operatively connected to a heat source (page 7, lines 15-17) and fluidly connected to the first evaporator 8 (page 7, lines 19-28). The first valve system 26, 27 controlling the amount of heat transferred to the evaporator 16 and thereby controlling an inlet pressure to the compressor 18 (page 9, lines 2-7 and 13-15; and page 12, lines 26-28).

According to claim 17, the first valve system 26, 27 is comprised of an evaporator valve 27 and an evaporator bypass valve 26. The evaporator valve 27 allows an evaporator heating fluid to flow to the first evaporator 16 and thereby transfer heat to the first evaporator

16. The evaporator bypass valve 26 allows fluid to bypass the first evaporator 16 (see Fig. 3; page 7, lines 19-23).

According to claim 18, the device of claim 1 further comprises a valve system 30, 31 operatively connecting the engine cooling loop 4 to the first condenser 20 when additional heating capacity is required (page 8, lines 14-18). When no additional heating capacity is required, the valve system 30, 31 operatively disconnects the first condenser 20 from the engine cooling loop 4 (page 8, lines 21-24).

Moreover, according to claim 19, the valve system 30, 31 is comprised of a condenser valve 31 and a condenser bypass valve 30. The condenser valve 31 is connected to the engine cooling loop 4 to allow the heat-carrying fluid to flow to the first condenser 20 and thereby allow heat to be transferred to the heat-carrying fluid in the engine cooling loop 4 (page 8, lines 21-24). The condenser bypass valve 30 is connected to the engine cooling loop 4 to allow the heat-carrying fluid to bypass the condenser 20 so that no heat is transferred from the first condenser 20 to the heat-carrying fluid (page 8, lines 14-20).

According to claim 20, the device of claim 15 further comprises a second valve system 30, 31 wherein the engine cooling loop 4 is operatively connected to the first condenser 20 by the second valve system 30, 31 when additional heating capacity is required, and operatively disconnected from the first condenser 20 by the second valve system 30, 31 when no additional heating capacity is required (page 8, lines 14-24).

According to claim 21, the second valve system 30, 31 comprises a condenser valve 31 and a condenser bypass valve 30. The condenser valve 31 allows fluid to flow to the first condenser 20 and thereby transfer heat to the heat-carrying fluid in the engine cooling loop 4. The condenser bypass valve 30 allows fluid to bypass the condenser so that no heat is

transferred from the first condenser 20 to the heat carrying fluid (see Fig. 3; page 8, lines 21-24).

According to claim 22, the second valve system 30, 31 is adapted to control the loading of the compressor 18 (page 9, lines 24-32).

According to claim 23, the cooling loop 4 includes a first valve system 26, 27 to control the quantity of heat-carrying fluid which passes through the first condenser 20 and the heat-pump loop 14 includes a second valve system 30, 31 to control the quantity of heat-carrying fluid which passes through the first evaporator 18, so that the first and second valve (26, 27 and 30, 31) systems control an intake pressure of the compressor 18 (page 7, lines 18-28; page 8, lines 14-24; page 9, lines 2-7 and 13-15; and page 12, lines 26-28).

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 12, 15 and 17-23 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

Claims 2, 8, 9, 11 and 12 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 2, 10, 11, 13 and 14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of JP 10-76837 (hereinafter referred to as JP '837) and Enomoto et al. (US 5,291,941) (hereinafter referred to as Enomoto), Fifure 8, and the description thereof.

Claims 8 and 9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the

prior art as applied to claim 1 above, and further in view of Echigoya et al. (US 5,971,290) (hereinafter referred to as Echigoya).

Claims 12, 15 and 17-23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 1 above, and further in view of Whalen (US 3,910,345) (hereinafter referred to as Whalen) or Momose (JP 5-24134) (hereinafter referred to as JP '134) or FR 2288278 (hereinafter referred to as FR '278).

Claims 15 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 1 above, and further in view of JP 63-207709 (hereinafter referred to as JP '709).

Claims 18 and 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 1 above, and further in view of JP 11-34640 (hereinafter referred to as JP '640).

Claims 12 and 20-23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 15 above, and further in view of JP 11-34640 (hereinafter referred to as JP '640).

(7) ARGUMENTS

Sub-paragraph (i)

Claims 12, 15 and 17-23 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. It is noted that claim 12 is an independent claim. It is also noted that claims 15 and 17-23 depend upon the base claim 1.

The Examiner alleges that claims 12, 15 and 17-23 contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. More specifically the Examiner alleges that claims 12, 15 and 17-23 contain "some automatic control system of these valves to produce some intended effect on compressor pressure".

Applicant respectfully disagrees. Claims 12, 15 and 17-23 do not disclose any automatic control of the valve system in the device of the present invention. For instant, claim 12 recites "first valve system of the first evaporator for controlling the quantity of heat-carrying fluid which passes through the first evaporator an anti-return valve upstream of the evaporator, the first condenser, second valve system of the first condenser for controlling the quantity of heat-carrying fluid which passes through the first condenser, the switching device and a pressure-reduction means of the heat-pump loop for reducing the pressure of the refrigerant fluid between the first condenser and the first evaporator" (emphases added). These limitations are disclosed on page 5, lines 9-17 of the specification.

Therefore, the rejection of claims 12, 15 and 17-23 under 35 U.S.C. 112, first paragraph, is improper.

Sub-paragraph (ii)

Claims 2, 8, 9, 11 and 12 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is noted that claims 2, 8, 9 and 11depend upon the

base claim 1. It is also noted that claim 12 is an independent claim.

Regarding claims 2 and 11: the Examiner alleges that it is unclear which of the two claimed evaporators or two claimed condensers of claim 1, applicant is referring to.

Claims 2 and 11 recite the evaporator and the condenser of the heat-pump loop. As clearly recited in claim 1, the heat-pump loop has only one (first) evaporator and only one (first) condenser. The second evaporator and condenser are included in the air-conditioning branch of the claimed device.

Regarding claims 8 and 9: the Examiner alleges that these claims recite an accumulator that doesn't appear to exist in elected Figure 3.

Although Fig. 3 does not show the refrigerant-fluid accumulator, the specification clearly discloses on page 12, lines 18-21, that "Another difference consists in the fact that the accumulator, separated in the embodiment of Figure 1, is integrated into the evaporator 16" (emphasis added).

Regarding claim 12: the Examiner alleges that claim 12 is very vague. The Examiner further alleges that a host of not previously claimed or not well-defined structure is found in the second paragraph of that claim including: "first valve system," and the "second valve system." Applicant believes that all elements recited in claim 12, including "first valve system," and the "second valve system", are well-defined. Moreover, as clearly shown in Fig. 3, the anti-return valve 42 is disposed upstream of the evaporator 16.

Sub-Paragraph (iv)

Claims 1, 2, 10, 11, 13 and 14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of JP '837 and Enomoto, Figure 8, and the description thereof. It is noted that claim 1 is an independent claim. It is noted that claims 2, 10, 11, 13 and 14 depend upon a base claim 1.

Regarding claim 1: JA '837 describes a heater system with two heater cores 13 and 23 that are designed to be installed in the front and rear of an automobile to improve heater performance. However, JA '837 has no ability to cool the passenger compartment.

Enomoto teaches in Figure 8 a refrigerant based heater circuit (182, 13, 37, 15) and a refrigerant based cooler circuit (181, 11, 12, 30, 36 and 24) connected in parallel across the output and inputs of the compressor 10.

The Examiner indicates that it would be obvious to add the refrigerant-based air conditioning system of Enomoto onto the heater system of JA '837 so that the two systems overlap to share a compressor.

As stated in In re Kotzab, 217 F.3d 1365, 1369-70,55 USPQ2d 1313, 1316 (Fed. Cir. 2000):

> Most if not all inventions arise from a combination of old elements. Thus, every element of a claimed invention may often be found in the prior art. However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant [citations omitted].

JA '837 is specifically directed to the "automobile heating system that is capable of improvement in heating performance at both front and rear sides", while Enomoto clearly states that "An object of the present invention is to increase the heating ability of an air conditioner by using a high-temperature and high-pressure gas-phase refrigerant" (emphasis added).

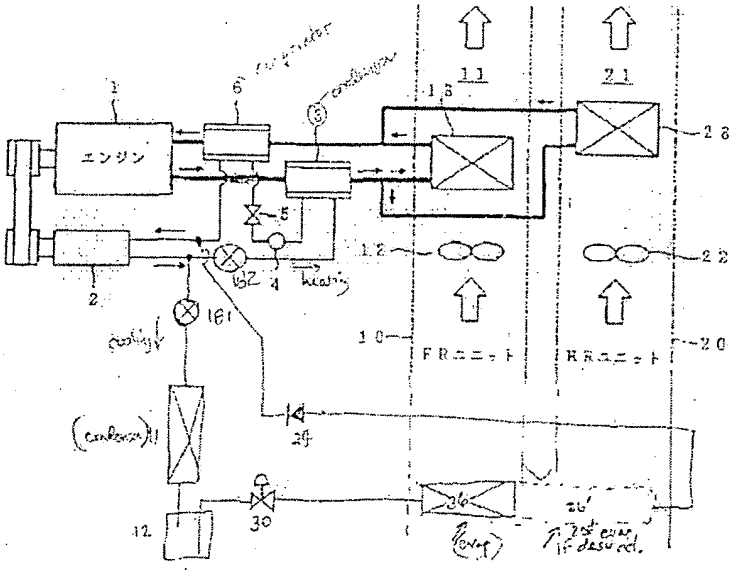
JA '837 gives no indication that adding an air-conditioning (a/c) circuit of Enomoto would be at all desirable or would improve the functionality of its heating system. The mere fact that the heating and cooling systems for the passenger compartments of the automobile were known in the art at the time of appellants' invention, would not have provided any suggestion to add the a/c circuit of Enomoto to the heating system of JA '837. Moreover, the prior art provides no suggestion or motivation to combine the heating system of JA '837 provided for improvement in heating performance at both front and rear sides, with the a/c circuit of Enomoto provided for increasing heating ability of the conditioner, as JA '837 has no conditioner. Besides, why would one of ordinary skill in the art combine the heating system of JA '837 with the a/c circuit of Enomoto, when Enomoto already has both heating and cooling circuits?

The Examiner further indicates that the motivation to combine JA '837 and Enomoto would be to supply air conditioning to "preserve occupant comfort." However, that statement does not address the need for a teaching found in the prior art that suggests combining the specific prior art components to realize the present invention.

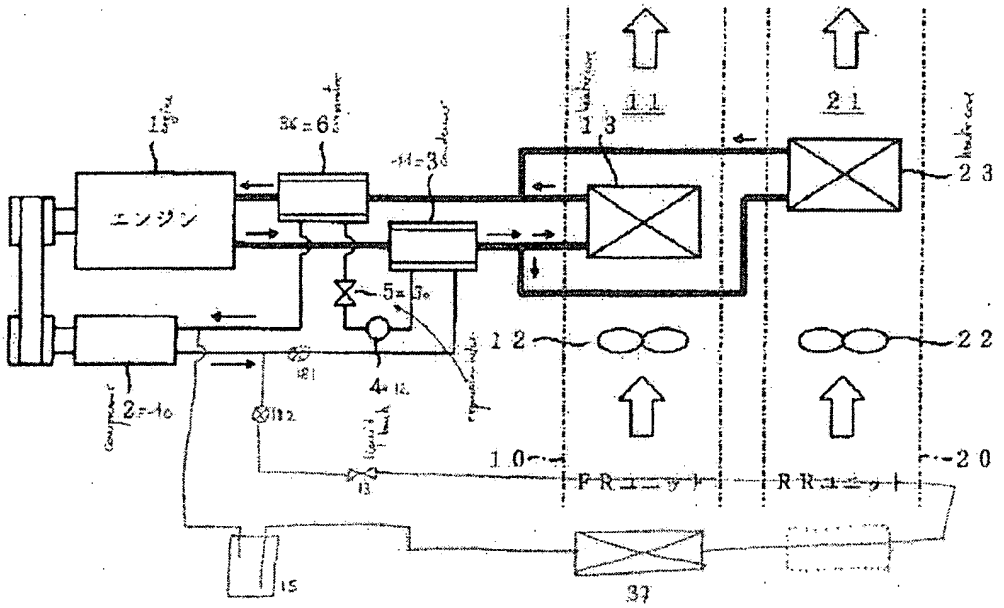
There are multiple ways to air condition an automobile – why would one of ordinary skill in the art combine these references to provide air conditioning in this way? Specifically, why would one of ordinary skill in the art be motivated to dismantle the heating/cooling

system described in Enomoto and graft it on to the heater described in JA '837 to create another heating/cooling system, and where is this motivation suggested in the prior art?

Indeed, even if one of skill in the art modified JP 10-76837 in the manner suggested by the Examiner, such combination would not achieve the presently claimed invention. The Examiner sketch is reprinted below.

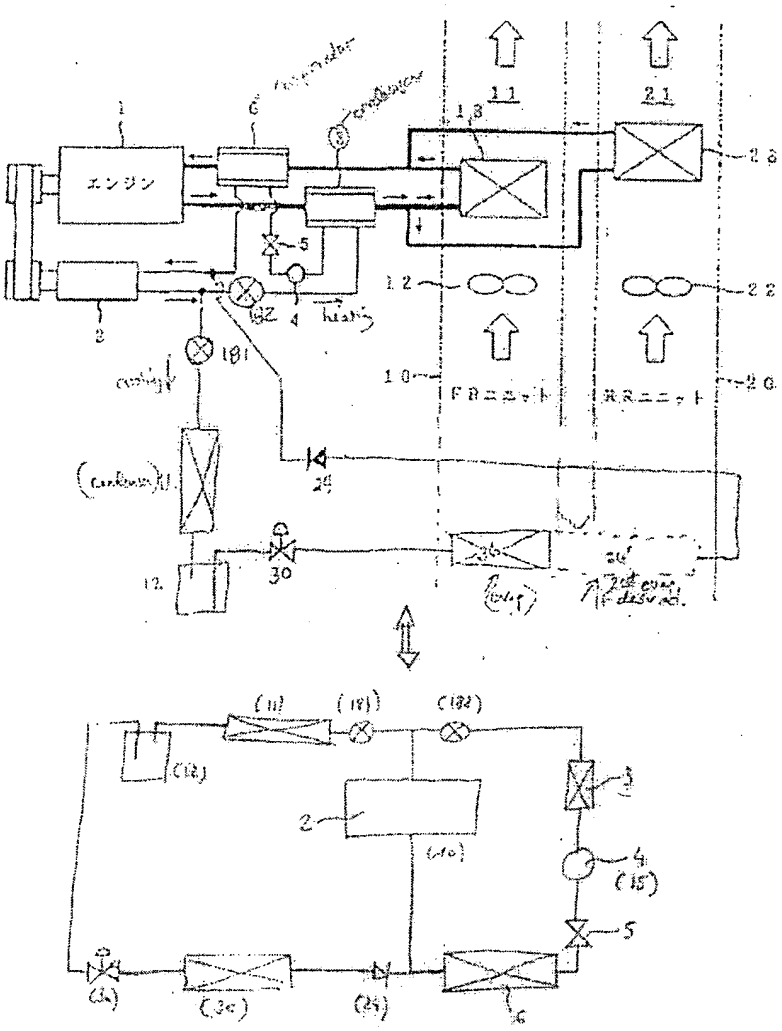


Contrary to the Examiner's assertion, if one of skill in the art modified JP '837 in view of Enomoto, the resulting system would take the following form, as both Enomoto and JA '837 inventions are directed to enhancing heating abilities. The hand-written portions relates to Enomoto '941.



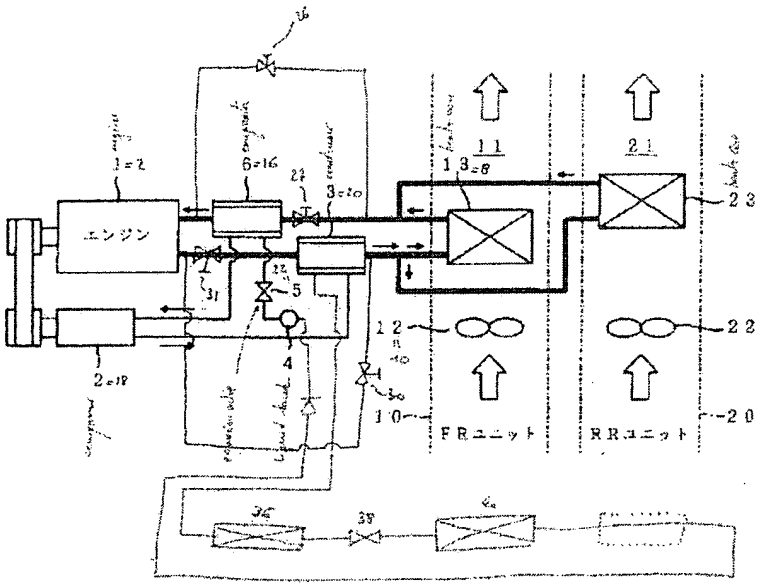
From the foregoing sketch, it is clear that the combination suggested by the Examiner would not result in the system of the pending claims.

Another way to view the system developed by the Examiner to make the present rejection based on JP '837 and Enomoto is reprinted below showing the Examiner's sketch and an alternative equivalent sketch of the same system.



From the foregoing sketch, it is clear that the combination suggested by the Examiner fails to render obvious "a switching device making it possible to make the refrigerant fluid circulate either in the air-conditioning branch, or in the heat-pump branch, is such a way as to form a heat-pump loop" as recited in claim 1.

In actuality, one of skill in the art would have to modify the teaching of JP 10-76837 in the following manner to achieve the structure of the currently claimed invention.



However, the prior art submitted by the Examiner to modify JP 10-76837 fails to teach or render obvious the features shown above. Even if some of the concepts illustrated above are known in the prior art, there is motivation to modify JP 10-76837 to achieve the system shown above.

The modular-type modification suggested by the Examiner would not occur to one of ordinary skill in the art. "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior reference or references of record convey or suggest that knowledge is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against the teacher." See W. L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 312, 313 (Fed Cir. 1983).

The Examiner's assertion that these references may be modified to achieve the limitations of the present invention would clearly result from **hindsight reconstruction**. MPEP 2143.01 specifically states that the mere fact that references can be combined does not render the resultant combination obvious unless the references suggest the desirability of the combination, citing *In Re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). There is no

suggestion to support the Examiner's assertion. The Examiner has simply reconstructed the Applicant's claimed invention based on the applicant's own teaching. This type of obviousness analysis/determination is not proper.

Furthermore, the claimed switching device is not disclosed in JA '837 or Enomoto. The Examiner refers to the switching system comprising valves 181, 182 disclosed in Enomoto Figure 8, however, the disclosed valves are two way (open or closed) valves, whereas to function as suggested by the Examiner's sketch, the valves 181, 182 would have to be automated 3 way valves. The valves 181, 182 would also have to be automated to function based on different criteria, since Enomoto Figure 8 does not disclose an operatively attached engine cooling circuit and the Enomoto heating circuit consists only of a condenser (heat exchanger 37), rather than a condenser 20 and an evaporator 16, as disclosed in Figure 1 of the current invention, and as disclosed in JA '837. Multiple other variations exist that distinguish the Enomoto switching means 181, 182 from the switching means disclosed in the current invention, and render the switching means unworkable in combination with the engine cooling circuit and heat pump circuit disclosed in JA '837.

Therefore, the rejection of claim 1 under 103(a) over JA '837 and Enomoto is improper.

Regarding claim 2: In addition to the above arguments regarding the rejection of claim 1, the prior art fails to disclose the evaporator of the heat-pump loop integrated into the cooling loop, upstream of the engine. As is clearly seen in Fig. 8 of JA '837, the evaporator 6 is located downstream of the engine 1.

Regarding claim 11: In addition to the above arguments regarding the rejection of claim 1, the prior art fails to disclose the pressure-reducing means for reducing the pressure of the refrigerant fluid between the condenser and the evaporator.

Regarding claims 10, 13 and 14: In addition to the above arguments regarding the rejection of claim 1, claims 10, 13 and 14 include additional limitations further defining the present invention over the prior art.

Claims 8 and 9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 1 above, and further in view of Echigoya. It is noted that claim 8 depends upon the base claim 1, while claim 9 depends upon claim 8.

In addition to the above arguments regarding the rejection of claim 1, claims 8 and 9 include additional limitations further defining the present invention over the prior art. Furthermore, the prior art fails to disclose refrigerant-fluid accumulator common to the air-conditioning loop and to the heat-pump loop. As disclosed by Echigoya, the accumulator 66 is common only to the air-conditioning loop.

Claims 12, 15 and 17-23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 1 above, and further in view of Whalen or JP '134 or FR '278. It is noted that claim 12 is an independent claim. It is noted that claims 15 and 17-23 depend upon the base claim 1.

Regarding claim 12: In addition to the above arguments regarding the rejection of

claim 1, neither Whalen nor JP '234 nor FR '278 discloses the arrangement of claim 12. More specifically, Whalen, JP '234 and FR '278 fail to disclose a modular casing containing a first valve system for controlling the quantity of heat-carrying fluid which passes through the first evaporator and second valve system of the first condenser for controlling the quantity of heat-carrying fluid which passes through the first condenser. Also, none of the references cited by the Examiner discloses the switching device for directing the refrigerant fluid circulate either in the air-conditioning branch, or in the heat-pump branch.

Indeed, Whalen discloses the heating and cooling system for multi-story buildings and teaches "...the bypass valves 56, 58 are employed so that certain quantities of returning chilled water and hot water, which are at different temperatures than those produced in the chiller 10 and heater 12, may bypass the chiller and heater 12 ..." (see col. 7, lines 5-10 of Whalen). Consequently, valves 56, 58 of Whalen do not anticipate the structure/function of the valves recited in claim 12. Moreover, one of ordinary skill in the art would not find obvious to combine teachings of the heating/air-conditioning system of a vehicle with the teachings of the heating and cooling system of the multi-story buildings. Lastly, the valve systems (26, 27, 30, 31) according to the present invention are disposed in succession in the engine-cooling loop (4). The fluid passes from heat exchanger (8) to the valve 26 or the valve 27 and then through the valve 30 or the valve 31. This disclosed structure according to Whalen depicts a configuration with two different circuits (a cooling circuit through the chiller 10 and a heating circuit through the heater 12). Those several circuits operate separately and in parallel one with the other. The valves (32, 34, 36, 38) of Whalen do not allow the fluid to pass through each one successively.

JP '234 neither discloses nor suggests the use of the valve system to control the

quantity of heat-carrying fluid which passes through the respective heat-exchanger. Indeed, JP '234 describes a combination of an air-conditioning circuit with a cooling water circuit and a warm water circuit. In relation with those circuits, the heat is transferred from one of those circuits to another one by intermediate heat exchangers. Moreover, even if we assume that referenced elements 16 and 17 are valve systems, they are not used for the purpose of the present invention.

FR '278 teaches the heat pump for air-conditioning of interior of a building. The heat pump of FR '278 does not have a heating branch. Thus, the system of FR '278 lacks the first evaporator and the first condenser being part of the heating branch, first valve system of the first evaporator, second valve system of the first condenser, and the switching device directing the refrigerant fluid circulate either in the air-conditioning branch, or in the heating branch.

Regarding claim 15: In addition to the above arguments regarding the rejection of claim 1, neither Whalen nor JP '234 nor FR '278 discloses the arrangement of claim 15. More specifically, Whalen, JP '234 and FR '278 fail to disclose an evaporator heat regulating loop comprising a first valve system operatively connected to a heat source and fluidly connected to the first evaporator so that the first valve system controls the amount of heat transferred to the evaporator and thereby controlling an inlet pressure to the compressor.

Indeed, Whalen discloses the heating and cooling system for multi-story buildings and teaches "...the bypass valve 56 is employed so that certain quantities of returning heated water may bypass the chiller 10, but not to control the amount of heat transferred to the evaporator and thereby controlling an inlet pressure to the compressor, as Whalen has no compressor. Consequently, valve 56 of Whalen does not anticipate the structure/function of

the valves recited in claim 15. Moreover, one of ordinary skill in the art would not find obvious to combine teachings of the heating/air-conditioning system of a vehicle with the teachings of the heating and cooling system of the multi-story buildings.

JP '234 neither discloses nor suggests the use of the valve system to control the quantity of heat-carrying fluid which passes through the respective heat-exchanger. Indeed, JP '234 describes a combination of an air-conditioning circuit with a cooling water circuit and a warm water circuit. In relation with those circuits, the heat is transferred from one of those circuits to another one by intermediate heat exchangers. Moreover, even if we assume that referenced elements 16 and 17 are valve systems, they are not used for the purpose of the present invention.

FR '278 teaches the heat pump for air-conditioning of interior of a building. The heat pump of FR '278 does not have a heating branch. Thus, the system of FR '278 lacks the first evaporator being part of the heating branch, first valve system of the first evaporator, and the switching device directing the refrigerant fluid circulate either in the air-conditioning branch, or in the heating branch.

Regarding claim 17: In addition to the above arguments regarding the rejection of claim 15, neither Whalen nor JP '234 nor FR '278 discloses the first valve system including two separate valves, namely an evaporator valve and an evaporator bypass valve.

Regarding claim 18: In addition to the above arguments regarding the rejection of claim 1, neither Whalen nor JP '234 nor FR '278 discloses the arrangement of claim 18. More specifically, Whalen, JP '234 and FR '278 fail to disclose an evaporator heat regulating

loop comprising a valve system operatively connected an engine cooling loop to the first condenser when additional heating capacity is required, and disconnecting the first condenser from the engine cooling loop when no additional heating capacity is required.

Whalen discloses the heating and cooling system for multi-story buildings. JP '234 neither discloses nor suggests the use of the valve system to control the quantity of heat-carrying fluid which passes through the respective heat-exchanger. FR '278 teaches the heat pump for air-conditioning of interior of a building.

Regarding claim 19: In addition to the above arguments regarding the rejection of claim 18, neither Whalen nor JP '234 nor FR '278 discloses the valve system including two separate valves, namely a condenser valve and a condenser bypass valve.

Regarding claim 20: In addition to the above arguments regarding the rejection of claim 15, neither Whalen nor JP '234 nor FR '278 discloses the arrangement of claim 18. More specifically, Whalen, JP '234 and FR '278 fail to disclose a second valve system wherein the engine cooling loop is operatively connected to the first condenser by the second valve system when additional heating capacity is required, and operatively disconnected from the first condenser by said second valve system when no additional heating capacity is required.

Whalen discloses the heating and cooling system for multi-story buildings. JP '234 neither discloses nor suggests the use of the valve system to control the quantity of heat-carrying fluid which passes through the respective heat-exchanger. FR '278 teaches the heat

pump for air-conditioning of interior of a building. None of the above references teaches the valve system fluidly connecting the engine cooling loop to the first condenser.

Regarding claim 21: In addition to the above arguments regarding the rejection of claim 20, neither Whalen nor JP '234 nor FR '278 discloses the second valve system including two separate valves, namely a condenser valve and a condenser bypass valve.

Regarding claim 22: In addition to the above arguments regarding the rejection of claim 21, Whalen, JP '234 and FR '278 fail to disclose a compressor and the second valve system adapted to control the loading of the compressor.

Regarding claim 23: In addition to the above arguments regarding the rejection of claim 1, Whalen, JP '234 and FR '278 fail to disclose a compressor, a first valve system controlling the quantity of heat-carrying fluid which passes through the first condenser and a second valve system to controlling the quantity of heat-carrying fluid which passes through the first evaporator, so as to control an intake pressure of the compressor.

Indeed, Whalen discloses the heating and cooling system for multi-story buildings and teaches "...the bypass valve 56 is employed so that certain quantities of returning heated water may bypass the chiller 10, but not to control the amount of heat transferred to the evaporator and thereby controlling an inlet pressure to the compressor, as Whalen has no compressor. Consequently, valve 56 of Whalen does not anticipate the structure/function of the valves recited in claim 15. Moreover, one of ordinary skill in the art would not find obvious to combine teachings of the heating/air-conditioning system of a vehicle with the

teachings of the heating and cooling system of the multi-story buildings. Lastly, the valve systems (26, 27, 30, 31) according to the present invention are disposed in succession in the engine-cooling loop (4). The fluid passes from heat exchanger (8) to the valve 26 or the valve 27 and then through the valve 30 or the valve 31. This disclosed structure according to Whalen depicts a configuration with two different circuits (a cooling circuit through the chiller 10 and a heating circuit through the heater 12). Those several circuits operate separately and in parallel one with the other. The valves (32, 34, 36, 38) of Whalen do not allow the fluid to pass through each one successively.

JP '234 neither discloses nor suggests the use of the valve system to control the quantity of heat-carrying fluid which passes through the respective heat-exchanger. Indeed, JP '234 describes a combination of an air-conditioning circuit with a cooling water circuit and a warm water circuit. In relation with those circuits, the heat is transferred from one of those circuits to another one by intermediate heat exchangers. Moreover, even if we assume that referenced elements 16 and 17 are valve systems, they are not used for the purpose of the present invention.

FR '278 teaches the heat pump for air-conditioning of interior of a building. The heat pump of FR '278 does not have a heating branch. Thus, the system of FR '278 lacks the first evaporator being part of the heating branch, first valve system of the first evaporator, and the switching device directing the refrigerant fluid circulate either in the air-conditioning branch, or in the heating branch.

Claims 15 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 1 above, and further in view of JP '709. It is noted that claim 15

depends upon the base claim 1 and claim 17 depends upon claim 15.

Regarding claim 15: In addition to the above arguments regarding the rejection of claim 1, JP '709 fails to disclose a first valve system operatively connected to a first evaporator so as to control the amount of heat transferred to the first evaporator and thereby controlling an inlet pressure to the compressor. JP '709 discloses a refrigerant pipeline 2 and a heater pipeline 10a separate from the refrigerant pipeline 2. As clearly seen in Fig. 2 of JP '709, the valves 11 and 13 control the engine coolant flow in the heater pipeline 10a and are not fluidly connected to the evaporator 3. Thus, the valves 11 and 13 are not controlling the amount of heat transferred to the evaporator 3 and thereby not controlling an inlet pressure to the compressor 1.

Regarding claim 17: In addition to the above arguments regarding the rejection of claim 15, claim 17 includes additional limitations further defining the present invention over the prior art.

Claims 18 and 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 1 above, and further in view of JP '640.

Regarding claim 18: The Examiner erroneously alleges that JP '640 shows a condenser bypass conduit 47 and a control valve 45 to introduce engine coolant fluid into the condenser heat exchanger 31. In fact, as clearly seen in Fig. 1 of JP '640, the conduit 47 bypasses the engine radiator 42 in the cooling water circuit 40, not the condenser 25 in the heat-pump loop,

as recited in claim 18 of the present invention.

Regarding claim 19: In addition to the above arguments regarding the rejection of claim 18, claim 19 includes additional limitations further defining the present invention over the prior art. More specifically, claim 19 recites two separate valves: a condenser valve and a condenser bypass valve; while JP '640 disclose a single valve 45.

Claims 12 and 20-23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art as applied to claim 15 above, and further in view of JP '640.

The Examiner erroneously alleges that JP '640 shows a condenser bypass conduit 47 and a control valve 45 to introduce engine coolant fluid into the condenser heat exchanger 31. The Examiner further alleges that to have added such valves and bypasses to the prior art (and, if necessary, outside heat exchanger 42 as shown in JP '640) would have been obvious to more adequately control the heating and to get rid of excess heat.

Regarding claim 12: In addition to the above arguments regarding the rejection of claim 1, JP '640 does not disclose the arrangement of claim 12. More specifically, JP '640 fails to disclose a modular casing containing a first valve system for controlling the quantity of heat-carrying fluid which passes through the first evaporator and second valve system of the first condenser for controlling the quantity of heat-carrying fluid which passes through the first condenser. Also, JP '640 does not disclose the switching device for directing the refrigerant fluid circulate either in the air-conditioning branch, or in the heat-pump branch. In fact, as clearly seen in Fig. 1 of JP '640, the conduit 47 bypasses the engine radiator 42 in the

cooling water circuit 40, not the condenser 25 in the heat-pump loop, as recited in claim 18 of the present invention.

Therefore, even if combination and modification of JP '837, Enomoto and JP '640, suggested by the Examiner, could be made, the resulting device still would lack the arrangement of claim 12. The Examiner's assertion that JP '837, Enomoto and JP '640 may be modified and combined to achieve the limitations of the present invention would clearly result from **hindsight reconstruction**.

Regarding claims 20-22: In addition to the above arguments regarding the rejection of claim 15, claims 20-22 include additional limitations further defining the present invention over the prior art.

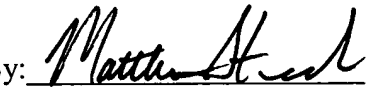
Regarding claim 23: In addition to the above arguments regarding the rejection of claim 1, JP '640 does not disclose the arrangement of claim 23. More specifically, JP '640 fails to disclose a first valve system to control the quantity of heat-carrying fluid which passes through the first condenser 25 and the heat-pump loop includes a second valve system to control the quantity of heat-carrying fluid which passes through the first evaporator 23, wherein the first and second valve system systems control an intake pressure of the compressor 21. In fact, as clearly seen in Fig. 1 of JP '640, the conduit 47 bypasses the engine radiator 42 in the cooling water circuit 40, not the condenser 25 in the heat-pump loop, as recited in claim 18 of the present invention.

The Examiner's allegations that adding such valves and bypasses to the prior art (and, if necessary, outside heat exchanger 42 as shown in JP '640) would have been obvious to

more adequately control the heating and to get rid of excess heat, clearly results from **hindsight reconstruction**, as non of the references cited provides any suggestion or motivation to combine these references.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance, and notice to that effect is earnestly solicited. Appellant will request an oral hearing on the merits within two months after the date of the Examiner's answer.

Respectfully submitted:
Liniak, Berenato & White

By: 
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(8) APPENDIX OF CLAIMS ON APPEAL

1. A device for heating and/or air conditioning the passenger compartment of a motor vehicle, comprising an engine-cooling loop in which a heat-carrying fluid circulates for taking up heat from the engine and returning the heat to an air heater; a heat-pump loop in which a refrigerant fluid circulates, said heat-pump loop containing a compressor, a first evaporator constituting a cold source of the heat pump at which the refrigerant fluid takes up heat from the surroundings, and a first condenser constituting a hot source of the heat pump at which the refrigerant fluid gives up heat, the first condenser being integrated into the engine-cooling loop upstream of the air heater, the device further comprising an air-conditioning branch containing a second condenser and a second evaporator, the air-conditioning branch having an upstream end connected to the heat-pump loop downstream of the compressor, and a downstream end connected to the heat-pump loop upstream of the compressor, and a switching device making it possible to make the refrigerant fluid circulate either in the air-conditioning branch, or in the heat-pump branch, is such a way as to form a heat-pump loop.

2. The device of Claim 1, wherein the evaporator of the heat-pump loop is integrated into the cooling loop, upstream of the engine.

8. The device of Claim 1, wherein the air-conditioning branch includes a refrigerant-fluid accumulator.

9. The device of Claim 8, wherein the evaporator constitutes a refrigerant-fluid accumulator common to the air-conditioning loop and to the heat-pump loop.

10. The device of Claim 1, wherein the air-conditioning branch includes an anti-return valve.

11. The device of Claim 1, wherein the heat-pump loop includes pressure-reducing means for reducing the pressure of the refrigerant fluid between the condenser and the evaporator.

12. A device for heating and/or air conditioning the passenger compartment of a motor vehicle, comprising an engine-cooling loop in which a heat-carrying fluid circulates for taking up heat from the engine and returning the heat to an air heater; a heat-pump loop in which a refrigerant fluid circulates, said heat-pump loop containing a compressor, a first evaporator constituting a cold source of the heat pump at which the refrigerant fluid takes up heat from the surroundings, and a first condenser constituting a hot source of the heat pump at which the refrigerant fluid gives up heat, the first condenser being integrated into the engine-cooling loop upstream of the air heater, the device further comprising an air-conditioning branch containing a second condenser and a second evaporator, the air-conditioning branch having an upstream end connected to the heat-pump loop downstream of the compressor, and a downstream end connected to the heat-pump loop upstream of the compressor, and a switching device making it possible to make the refrigerant fluid circulate either in the air-conditioning branch, or in the heat-pump branch, is such a way as to form a heat-pump loop, and

further comprising a modular casing containing the first evaporator, first valve system of the first evaporator for controlling the quantity of heat-carrying fluid which passes through the first evaporator an anti-return valve upstream of the evaporator, the first condenser, second valve system of the first condenser for controlling the quantity of heat-carrying fluid which passes through the first condenser, the switching device and a pressure-reduction means of the heat-pump loop for reducing the pressure of the refrigerant fluid between the first condenser and the first evaporator,

wherein said first valve system is operatively connected with said second valve to control an intake pressure of said compressor.

13. The device of Claim 1, wherein the engine is an internal-combustion engine.

14. The device of Claim 1, wherein the engine is an electric motor.

15. The device of Claim 1, wherein the device further comprises an evaporator heat regulating loop comprising a first valve system operatively connected to a heat source and fluidly connected to said first evaporator, said first valve system controlling the amount of heat transferred to said evaporator and thereby controlling an inlet pressure to said compressor.

17. The device according to claim 15 wherein said first valve system is comprised of an evaporator valve and an evaporator bypass valve, said evaporator valve allowing an

evaporator heating fluid to flow to said first evaporator and thereby transfer heat to said first evaporator, said evaporator bypass valve allowing fluid to bypass said first evaporator.

18. The device of Claim 1, further comprising a valve system operatively connecting said engine cooling loop to said first condenser when additional heating capacity is required, when no additional heating capacity is required said valve system operatively disconnects said first condenser from said engine cooling loop.

19. The device according to claim 18 wherein said valve system is comprised of a condenser valve and a condenser bypass valve, said condenser valve is connected to said engine cooling loop to allow said heat-carrying fluid to flow to said first condenser and thereby allow heat to be transferred to said heat-carrying fluid in said engine cooling loop, said condenser bypass valve is connected to said engine cooling loop to allow said heat-carrying fluid to bypass said condenser so that no heat is transferred from said first condenser to said heat-carrying fluid.

20. The device according to claim 15 further comprising a second valve system wherein said engine cooling loop is operatively connected to said first condenser by said second valve system when additional heating capacity is required, and operatively disconnected from said first condenser by said second valve system when no additional heating capacity is required.

21. The device according to claim 15 wherein said second valve system comprises a condenser valve and a condenser bypass valve, said condenser valve allowing fluid to flow to

said first condenser and thereby transfer heat to said heat-carrying fluid in said engine cooling loop, said condenser bypass valve allowing fluid to bypass said condenser so that no heat is transferred from said first condenser to said heat carrying fluid.

22. The device according to claim 21 wherein said second valve system is adapted to control the loading of said compressor.

23. The device of Claim 1 wherein the cooling loop includes a first valve system to control the quantity of heat-carrying fluid which passes through the first condenser and the heat-pump loop includes a second valve system to control the quantity of heat-carrying fluid which passes through the first evaporator,

wherein said first and second valve system systems control an intake pressure of said compressor.